



## City of Sturgis, South Dakota Cooperating Technical Partners Mapping Activity Statement

### Mapping Activity Statement No. 1 –Digital Flood Insurance Rate Map Production and Development of Updated Flood Data

In accordance with the Cooperating Technical Partners (CTP) Memorandum of Agreement dated July 16, 2002, between the City of Sturgis, Meade County, South Dakota, and the Federal Emergency Management Agency (FEMA), Mapping Activity Statement No.3 is as follows.

#### 1. Objective and Scope

The objective of the Flood Map Project documented in this Mapping Activity Statement for the City of Sturgis is to develop Digital Flood Insurance Rate Map (DFIRM) panels and Flood Insurance Study (FIS) report materials for the City of Sturgis, South Dakota. The DFIRM panels and FIS report materials will be produced in the FEMA Countywide Format. In addition, new and/or updated flood hazard data will be developed for the flooding sources listed below. These data will be developed using detailed-study methods.

Flooding Source	Reach Limits	Approximate Reach Length (Miles)
Bear Butte Creek	From Western Upstream Corporate Limits to Eastern Downstream Corporate Limits	3.0
Cook Canyon Creek	From Confluence with Bear Butte Creek to West of Short Track for Cook Canyon	1.0
Doland Creek	From Confluence with Bear Butte Creek to Macrotte Game Production Area	2.5
Deadman Gulch	From Confluence with Bear Butte Creek to Just Upstream of Elk Road	2.0
Vanocker Creek	From Confluence with Deadman Gulch to Just Upstream of Chicago and North Western Railroad Crossing	1.3
<b>Total</b>		<b>9.8</b>

FEMA and the following Mapping Partners will complete this Flood Map Project:

- City of Sturgis;
- Ferber Engineering Company, a contractor to the City of Sturgis; and
- Michael Baker Jr., Inc., the FEMA Flood Map Production Coordination Contractor (MCC) for Region VIII.

The activities for this Flood Map Project, including required Quality Assurance/Quality Control (QA/QC) reviews, and the Mapping Partners that will complete them are summarized in the table below. In the table below, the City of Sturgis is identified as “CTP.” All activities that are to be accomplished by the City of Sturgis or contractors to the City of Sturgis are included in the “CTP” column.

<b>ACTIVITY</b>	<b>CTP</b>	<b>MCC</b>
Activity 1 – Field Surveys and Reconnaissance	X	
Activity 2 – Topographic Data Development	X	
Activity 3 – Independent QA/QC Review of Topographic Data		X
Activity 4 – Hydrologic Analyses	X	
Activity 5 – Independent QA/QC Review of Hydrologic Analyses		X
Activity 6 – Hydraulic Analyses	X	
Activity 7 – Independent QA/QC Review of Hydraulic Analyses		X
Activity 8 – Floodplain Mapping (Detailed Riverine Analysis)	X	
Activity 9 – Independent QA/QC Review of Floodplain Mapping		X
Activity 10 – Base Map Acquisition and Preparation	X	
Activity 11 – DFIRM Production (Non-Revised Areas)		X
Activity 12 – DFIRM Production (Merging Effective and Revised Information)		X
Activity 12A – Application of DFIRM Graphic and Database Specifications		X
Activity 13 – Preliminary DFIRM and FIS Report Distribution		X
Activity 14 – Post-Preliminary Processing	X	X

The sections of this Mapping Activity Statement that follow describe the specific mapping activities associated with this Flood Map Project. Each activity description identifies the responsible Mapping Partner(s), the FEMA standards that must be met, and resultant map component.

## **Activity 1 - Field Surveys and Reconnaissance**

Responsible Mapping Partner: City of Sturgis

Scope: To supplement any field reconnaissance conducted during the Scoping Phase of this Flood Map Project, the City of Sturgis shall conduct a detailed field reconnaissance of the specified study reaches of Cook Canyon Creek, Doland Creek, Deadman Gulch, and Vanocker Creek to determine conditions along the floodplain(s), types and numbers of hydraulic and/or flood-control structures, apparent maintenance status of existing hydraulic structures, locations of cross sections to be surveyed, and other parameters needed for the hydrologic and hydraulic analyses. The City also shall conduct field surveys, including obtaining channel and floodplain cross sections, identifying or establishing temporary bench marks, and obtaining the physical dimensions of hydraulic and flood-control structures.

Standards: All work under Activity 1 shall be performed in accordance with the standards specified in Section 5 of this Mapping Activity Statement.

Products: In accordance with the Technical Support Data Notebook (TSDN) format described in Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners*, the City shall make the following products available to FEMA:

- A report summarizing the findings of the field reconnaissance;
- Maps and drawings that provide the detailed survey results; and
- A survey notebook containing cross sections and structural data for Cook Canyon Creek, Doland Creek, Deadman Gulch, and Vanocker Creek.

Appendix M may be downloaded from the FEMA Flood Hazard Mapping Web site at [www.fema.gov/pdf/fhm/frm\\_gsam.pdf](http://www.fema.gov/pdf/fhm/frm_gsam.pdf).

## **Activity 2 - Topographic Data Development**

Responsible Mapping Partner: City of Sturgis

Scope: To supplement the field surveys conducted under Activity 1, the City of Sturgis shall obtain additional topographic data for overbank areas of Bear Butte Creek, Cook Canyon Creek, Doland Creek, Deadman Gulch, and Vanocker Creek to delineate floodplain boundaries. The City shall develop new digital topographic mapping with a contour interval of 2 feet. The topographic mapping and all other mapping for this Flood Map Project shall be prepared using the National Geodetic Vertical Datum of 1929. Upon completion of topographic mapping, the City shall submit the mapping to the MCC for an independent QA/QC review as outlined in Activity 3. The City shall address all concerns or questions raised during the independent QA/QC review performed by the MCC under Activity 3.

Standards: All work under Activity 2 shall be performed in accordance with the standards specified in Section 5 of this Mapping Activity Statement.

Products: In accordance with the TSDN format described in Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners*, the City shall make the following products available to FEMA.

- Hardcopy topographic mapping;
- Completed Form No. 5 of *Revisions to National Flood Insurance Program Maps, Application/Certification Forms and Instructions* (MT-2), which is available from the FEMA Web site at [www.fema.gov/fhm/dl\\_mt-2.shtm](http://www.fema.gov/fhm/dl_mt-2.shtm);
- Report summarizing methodology and results;
- Digital work map with contours; and
- Metadata compliant with Federal Geographic Data Committee standards.

### **Activity 3 - Independent QA/QC Review of Topographic Data**

Responsible Mapping Partner: FEMA (MCC)

Scope: The MCC shall review the topographic data and mapping generated by the City of Sturgis under Activity 2 to ensure that they are consistent with FEMA standards as well as standard engineering practice and are sufficient to prepare the DFIRM.

Standards: All work under Activity 3 shall be performed in accordance with the standards specified in Section 5 of this Mapping Activity Statement.

Products: In accordance with the TSDN format described in Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners*, the MCC shall make the following products available to FEMA:

- A Summary Report that describes the findings of the independent QA/QC review; and
- Recommendations to resolve any problems that arise as a result of the independent QA/QC review.

### **Activity 4 – Hydrologic Analyses**

Responsible Mapping Partner: City of Sturgis

Scope: The City of Sturgis shall perform hydrologic analyses for Cook Canyon Creek, Doland Creek, Deadman Gulch, and Vanocker Creek using the U.S. Army Corps of Engineers (USACE) HEC-HMS computer model. The City will calculate peak flood discharges for the 10-, 2-, 1-, and 0.2-percent-annual-chance storm events for these flooding sources. The City shall use a hydrologic analysis completed by the USACE for Bear Butte Creek. These flood discharges will be the basis for subsequent hydraulic analyses of Cook Canyon Creek, Doland Creek, Deadman Gulch, and Vanocker Creek under Activity 6. In addition, the City shall address all concerns or questions regarding Activity 4 that are raised during the independent QA/QC review performed by the MCC under Activity 5.

Standards: All work under Activity 4 shall be performed in accordance with the standards specified in Section 5 of this Mapping Activity Statement.

Products: Upon completion of the hydrologic modeling for Cook Canyon Creek, Doland Creek, Deadman Gulch, or Vanocker Creek, the City shall submit the results of the hydrologic analysis to the MCC for an independent QA/QC review under Activity 5. The City shall submit the results for the remaining flooding sources for an independent QA/QC review at the completion of this Activity. In accordance with the TSDN format described in Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners*, the City shall make the following products available to FEMA:

- Digital copies of all hydrologic modeling (input and output) files for the 10-, 2-, 1-, and 0.2-percent-annual-chance storm events;
- Digital and hardcopy versions of Summary of Discharges Table presenting discharge data for Bear Butte Creek, Cook Canyon Creek, Doland Creek, Deadman Gulch, and Vanocker Creek;
- Digital and hardcopy versions of draft text for Section 3.1, Hydrologic Analyses, of FIS report; and
- Digital and hardcopy versions of all backup data used in the analysis, including work maps.

### **Activity 5 - Independent QA/QC Review of Hydrologic Analyses**

Responsible Mapping Partner: FEMA (MCC)

Scope: The MCC shall review the technical, scientific, and other data submitted by the City of Sturgis under Activity 4 to ensure that the data and modeling are consistent with FEMA standards and standard engineering practices and are sufficient to revise the FIRM. This work shall include, at a minimum, the activities listed below.

- Review the submittal for technical and regulatory adequacy, completeness of required information, application/certification forms, and supporting data and documentation. The technical review will focus on the following:
  - Use of acceptable model;
  - Use of appropriate methodology;
  - Correctly applied methodology/model, including QC of input parameters;
  - Comparison with gage data and/or regression equations, if appropriate; and
  - Comparison with discharges for contiguous reaches or flooding sources.
- Maintain records of all contacts, reviews, recommendations, and actions and make them readily available to FEMA.
- Maintain an archive of all data submitted for hydrologic modeling review. All supporting data should be retained for 3 years from the date funding recipient submits its final expenditure report to FEMA.

Standards: All work under Activity 5 shall be performed in accordance with the standards specified in Section 5 of this Mapping Activity Statement.

Products: In accordance with the TSDN format described in Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners*, the MCC shall make the following products available to FEMA:

- A Summary Report that describes the findings of the independent QA/QC review; and
- Recommendations to resolve any problems that arise as a result of the QA/QC review.

## **Activity 6 – Hydraulic Analyses**

Responsible Mapping Partner: City of Sturgis

Scope: The City of Sturgis shall perform hydraulic analyses for Cook Canyon Creek, Doland Creek, Deadman Gulch, and Vanocker Creek. The hydraulic model, which will be developed using the USACE HEC-RAS computer program, shall include the 10-, 2-, 1-, and 0.2-percent-annual-chance storm events based on the peak discharges computed under Activity 4. The City shall use cross-section and field data collected under Activity 1 to perform the hydraulic analyses. The hydraulic analyses shall be used to establish flood elevations and regulatory floodways for the subject flooding sources. The flood elevations shall be referenced to the National Geodetic Vertical Datum of 1929. The City also shall use a hydraulic analysis performed by the USACE for Bear Butte Creek.

The City shall use the FEMA CHECK-RAS checking program to check the reasonableness of the hydraulic analysis. To facilitate the independent QA/QC review under Activity 7, the City shall provide explanations for unresolved messages from the CHECK-RAS program, as appropriate. In addition, the City shall address all concerns or questions regarding Activity 6 that are raised during the independent QA/QC review performed by the MCC under Activity 7.

Standards: All work under Activity 6 shall be performed in accordance with the standards specified in Section 5 of this Mapping Activity Statement.

Products: Upon completion of the hydraulic modeling for Cook Canyon Creek, Doland Creek, Deadman Gulch, or Vanocker Creek, the City shall submit the results to the MCC for an independent QA/QC review under Activity 7. The City shall submit the results for the remaining flooding sources, including Bear Butte Creek, for an independent QA/QC review at the completion of this Activity. In accordance with the TSDN format described in Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners*, the SC shall make the following products available to FEMA:

- Digital profiles of the 10-, 2-, 1- and 0.2-percent-annual-chance water-surface elevations representing existing conditions using FEMA’s RASLOT program or similar software;
- Digital and hardcopy versions of Floodway Data Table that is compatible with the DFIRM database;
- Digital and hardcopy versions of all hydraulic modeling (input and output) files;

- Digital and hardcopy versions of table with range of Manning’s “n” values;
- Explanations for unresolved messages from the CHECK-RAS program, as appropriate;
- Digital and hardcopy versions of all backup data used in the analyses;
- Digital and hardcopy versions of draft text for inclusion in Section 3.2, Hydraulic Analyses, of the FIS report; and
- All input and output data, intermediate data processing products, Geographic Information System (GIS) data layers, and final products.

### **Activity 7 - Independent QA/QC Review of Hydraulic Analyses**

Responsible Mapping Partner: FEMA (MCC)

Scope: The MCC shall review the technical, scientific, and other data submitted by the City of Sturgis under Activity 6 to ensure that the data and modeling are consistent with FEMA standards and standard engineering practices and are sufficient to prepare the DFIRM. This independent QA/QC review of the hydraulic analyses shall include, at a minimum, the activities listed below.

- Review submittal for technical and regulatory adequacy, completeness of required information, application/certification forms, and supporting data and documentation. The technical review shall focus on the following:
  - Use of acceptable model;
  - Starting water-surface elevations;
  - Cross-section geometry;
  - Manning’s “n” values and expansion/contraction coefficients;
  - Bridge and culvert modeling;
  - Flood discharges;
  - Regulatory floodway computation methods; and
  - Tie-in to upstream and downstream non-revised Flood Profiles.
- Use the CHECK-RAS program to flag potential problems and focus review efforts.
- Maintain records of all contacts, reviews, recommendations, and actions and make them readily available to FEMA.
- Maintain an archive of all data submitted for hydraulic modeling review. (All supporting data must be retained for 3 years from the date funding recipient submits its final expenditure report to FEMA.)

Standards: All work under Activity 7 shall be performed in accordance with the standards specified in Section 5 of this Mapping Activity Statement.

Products: In accordance with the TSDN format described in Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners*, the MCC shall make the following products available to FEMA:

- A Summary Report that describes the findings of the independent QA/QC review; and
- Recommendations to resolve any problems that arise as a result of the independent QA/QC review.

## **Activity 8 – Floodplain Mapping (Detailed Riverine Analysis)**

Responsible Mapping Partner: City of Sturgis

Scope: The City of Sturgis shall delineate the 1- and 0.2-percent-annual-chance floodplain boundaries and the regulatory floodway boundaries for Bear Butte Creek, Cook Canyon Creek, Doland Creek, Deadman Gulch, and Vanocker Creek on a digital work map. In delineating the floodplain and regulatory floodway boundaries, the City shall incorporate all revised hydraulic modeling developed under Activity 7 and newly acquired topographic data developed under Activity 2. In addition, the City shall incorporate the results of all effective Letters of Map Change within the revised area as appropriate. Also, the City shall address all concerns or questions regarding Activity 8 that are raised during the independent QA/QC review performed by the MCC under Activity 9.

Standards: All work under Activity 8 shall be performed in accordance with the standards specified in Section 5 of this Mapping Activity Statement.

Products: Upon completion, the City shall submit the digital floodplain mapping for Bear Butte Creek, Cook Canyon Creek, Doland Creek, Deadman Gulch, or Vanocker Creek to the MCC for an independent QA/QC review under Activity 9. The City shall submit the digital floodplain mapping for the remaining flooding sources for an independent QA/QC review at the completion of this Activity.

In accordance with the TSDN format described in Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners*, the City shall make the following products available to FEMA:

- Digital work maps showing the 1- and 0.2-percent-annual-chance floodplain boundary delineations, regulatory floodway boundary delineations, cross sections, Base Flood Elevations (BFEs), flood insurance risk zone labels, and all applicable base map features;
- DFIRM mapping files, prepared in accordance with the requirements in *Guidelines and Specifications for Flood Hazard Mapping Partners*;
- Metadata files describing the DFIRM data, including all required information shown in *Guidelines and Specifications for Flood Hazard Mapping Partners*;
- Complete set of plots of DFIRM panels showing all detailed flood hazard information at a suitable scale;

- A Summary Report that describes and provides the results of all automated or manual QA/QC review steps taken during the preparation of the DFIRM; and
- Any backup or supplemental information used in the mapping required for the independent QA/QC review outlined in Activity 9.

### **Activity 9 - Independent QA/QC Review of Floodplain Mapping**

Responsible Mapping Partner: FEMA (MCC)

Scope: The MCC shall review the digital work maps submitted by the City of Sturgis under Activity 8 to ensure that the results of the hydraulic analyses are accurately represented on the work maps. This work shall include, at a minimum, the activities listed below.

- Review the cross sections for proper location and orientation on the work map and agreement with the Floodway Data Table.
- Review the BFEs shown on the work map for proper location and agreement with the results of the hydraulic modeling.
- Review the regulatory floodway widths for agreement with the widths shown in the Floodway Data Table and the results of the hydraulic modeling.
- Review the floodplain boundaries for agreement with the flood elevations shown in the Floodway Data Table and the contour lines and other topographic information shown on the work maps.
- Review floodplain widths at cross sections as shown on the work maps to ensure they match the Floodway Data Table.
- Review the floodplain boundaries as shown on the work maps to ensure they match the Flood Profiles.
- Review the flood insurance risk zones as shown on the work maps to ensure they are labeled properly.
- Review the DFIRM mapping files to ensure they were prepared in accordance with the requirements in *Guidelines and Specifications for Flood Hazard Mapping Partners*.
- Review the metadata files to ensure they include all required information shown in *Guidelines and Specifications for Flood Hazard Mapping Partners*.

Standards: All work under Activity 9 shall be performed in accordance with the standards specified in Section 5 of this Mapping Activity Statement.

Products: In accordance with the TSDN format described in Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners*, the MCC shall make the following products available to FEMA:

- A Summary Report that describes the findings of the independent QA/QC review noting any deficiencies and providing recommendations to resolve them or agreeing with the mapping results; and
- An annotated work map with all questions and/or concerns indicated if necessary.

### **Activity 10 - Base Map Acquisition and Preparation**

Responsible Mapping Partner: City of Sturgis

Scope: Activity 10 consists of obtaining the digital base map for the project. The City of Sturgis shall provide the digital base map. The required activities are as follows:

- Obtain digital files (raster or vector) of the base map;
- Secure necessary permissions from the map source to allow FEMA's use and distribution of hardcopy and digital map products using the digital base map, free of charge;
- Certify that the digital data meet the minimum standards and specifications that FEMA requires for DFIRM production; and
- Populate the DFIRM database for base map features and applicable data.

Standards: All work under Activity 10 shall be performed in accordance with the standards specified in Section 5 of this Mapping Activity Statement.

Products: In accordance with the TSDN format described in Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners*, the CWCB shall make the following products available to FEMA.

- Written certification that the digital data meet the minimum FEMA standards and specifications; and
- Documentation that FEMA can use the digital base map.

### **Activity 11 – DFIRM Production (Non-Revised Areas)**

Responsible Mapping Partner: FEMA (MCC)

Scope: The MCC shall convert the effective FIRM and Flood Boundary and Floodway Map (FBFM) panels for all areas except the portions of Bear Butte Creek, Cook Canyon Creek, Doland Creek, Deadman Gulch, and Vanocker Creek that are being studied by the City of Sturgis into digital format in conformance with FEMA DFIRM specifications. The MCC shall use the base map acquired under Activity 10 for the conversion. The scope of Activity 11 covers the digitization of approximately 6 FIRM panels and 1 FBFM panel. The MCC also shall

incorporate Letters of Map Change issued by FEMA since the date of the current effective FIRM for each affected panel.

The digital flood theme for the flooding sources specified in Section 1 of this Mapping Activity Statement shall not be digitized under Activity 11. Rather, the MCC shall leave these as “holes” in the digital flood theme that will be filled in as part of Activity 12 using digital flood data developed by the City of Sturgis under Activity 8.

Standards: All work conducted under Activity 11 shall be performed in accordance with the standards specified in Section 5 of this Mapping Activity Statement.

Products: In accordance with the TSDN format requirements described in Appendix M of FEMA’s *Guidelines and Specifications for Flood Hazard Mapping Partners*, the MCC shall make the following products available to FEMA:

- Digital work maps showing the 1- and 0.2-percent-annual-chance floodplain boundary delineations, regulatory floodway boundary delineations, cross sections, BFEs, flood insurance risk zone labels, and all applicable base map features;
- DFIRM mapping files, prepared in accordance with the requirements in *Guidelines and Specifications for Flood Hazard Mapping Partners*;
- Metadata files describing the DFIRM data, including all required information shown in *Guidelines and Specifications for Flood Hazard Mapping Partners*;
- Complete set of plots of DFIRM panels showing all detailed flood hazard information at a suitable scale; and
- A Summary Report that describes and provides the results of all automated or manual QA/QC review steps taken during the preparation of the DFIRM, including a check that the road and floodplain relationship is maintained for all non-revised areas.

## **Activity 12 – DFIRM Production (Merging Effective and Revised Information)**

Responsible Mapping Partner: FEMA (MCC)

Scope: Upon completion of Activities 8 and 11, the MCC shall merge the digital floodplain data into a single updated DFIRM. This work will include tie-in of flood hazard information for areas that were not studied as part of the Flood Map Project documented in this Mapping Activity Statement. The MCC also shall tie in the revised and non-revised Flood Profiles, floodplain boundaries, and regulatory floodway boundaries. The MCC shall coordinate with the City of Sturgis, Meade County, and FEMA, as necessary, to resolve any potential tie-in issues.

Standards: All work conducted under Activity 11 shall conform to the standards specified in Section 5 of this Mapping Activity Statement.

Products: In accordance with the TSDN format requirements described in Appendix M of FEMA’s *Guidelines and Specifications for Flood Hazard Mapping Partners*, the MCC shall make the following products available to FEMA:

- Digital work maps showing the 1- and 0.2-percent-annual-chance floodplain boundary delineations, regulatory floodway boundary delineations, cross sections, BFEs, flood insurance risk zone labels, and all applicable base map features;
- DFIRM mapping files, prepared in accordance with the requirements in *Guidelines and Specifications for Flood Hazard Mapping Partners*;
- Metadata files describing the DFIRM data, including all required information shown in *Guidelines and Specifications for Flood Hazard Mapping Partners*;
- Complete set of plots of DFIRM panels showing all detailed flood hazard information at a suitable scale; and
- A Summary Report that describes and provides the results of all automated or manual QA/QC review steps taken during the preparation of the DFIRM.

### **Activity 12A – Application of DFIRM Graphic and Database Specifications**

Responsible Mapping Partner: FEMA (MCC)

Scope: The MCC shall apply the final FEMA DFIRM graphic and database specifications to the DFIRM files produced under Activity 12. This work shall include adding all required annotation, line pattern, area shading, and map collar information (e.g., map borders, title blocks, legends, notes to user).

Standards: All work under Activity 12A shall be performed in accordance with the standards specified in Section 5 of this Mapping Activity Statement.

Products: In accordance with the TSDN format described in Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners*, the MCC shall make the following products available to FEMA.

- Digital work maps showing 1-percent-annual-chance floodplain boundary delineations, cross sections, BFEs, flood insurance risk zone designation labels, and all applicable base map features shown;
- DFIRM mapping files, prepared in accordance with the requirements in *Guidelines and Specifications for Flood Hazard Mapping Partners*;
- Metadata files describing the DFIRM data, including all required information shown in *Guidelines and Specifications for Flood Hazard Mapping Partners*;
- Complete set of plots of DFIRM panels showing all detailed flood hazard information at a suitable scale; and
- A Summary Report that describes and provides the results of all automated or manual QA/QC review steps taken during the preparation of the DFIRM.

## **Activity 13 – Preliminary DFIRM and FIS Report Distribution**

Responsible Mapping Partner: FEMA (MCC)

Scope: Activity 13 consists of the final preparation, review, and distribution of the Preliminary copies of the DFIRM and FIS report for community and public review and comment. The activities to be performed are summarized below.

*Preliminary Transmittal Letter Preparation.* The MCC shall prepare letters to transmit the Preliminary copies of the DFIRM and FIS report and related enclosures to the City of Sturgis, Meade County, the State NFIP Coordinator, the FEMA Regional Office, and others as directed by FEMA.

*FIS Report Preparation:* The MCC shall prepare an FIS report in the FEMA Countywide Format as required by FEMA.

*Final QA/QC Review of Preliminary DFIRM and FIS Report:* The MCC shall perform a final QA/QC review of the Preliminary DFIRM and FIS report, including all data tables, Flood Profiles, and other components of the FIS report. The QA/QC review procedures shall be consistent with the *Guidelines and Specifications for Flood Hazard Mapping Partners*.

*Discrepancy Resolution:* The MCC shall work with the City and FEMA to resolve discrepancies identified during the final QA/QC review.

*Distribution of Preliminary DFIRM and FIS Report:* The MCC shall distribute the Preliminary copies of the DFIRM and FIS report to the City of Sturgis, Meade County, the State NFIP Coordinator, the FEMA Regional Office, and others as deemed appropriate by FEMA.

*News Release Preparation:* The MCC shall prepare a news release notification of BFE changes and perform a QA/QC review for accuracy and compliance with FEMA format requirements. The MCC shall file the notification for later submittal to FEMA for review.

*Preliminary Summary of Map Actions (SOMA) Preparation:* The MCC shall prepare Preliminary SOMAs for the City and County if appropriate. The SOMAs shall list pertinent information regarding Letters of Map Change that will be affected by the issuance of the DFIRM (i.e., superseded, incorporated, revalidated).

Standards: All work under Activity 13 shall be performed in accordance with the standards specified in Section 5 of this Mapping Activity Statement.

Products: The MCC shall make the following products available when requested by FEMA:

- Preliminary transmittal letters shall be prepared. These letters and any additional letters requested by FEMA shall be prepared in accordance with the current version of the *FEMA Document Control Procedures Manual*.

- Preliminary copies of the DFIRM and FIS report, including all updated data tables and Flood Profiles shall be mailed to the City and County Chief Executive Officers (CEOs) and floodplain administrators, the State NFIP Coordinator, the FEMA Regional Office, and others as directed by FEMA.
- Preliminary SOMAs, prepared in accordance with FEMA requirements, shall be provided as appropriate.
- Revised DFIRM mapping files, prepared in accordance with the requirements in *Guidelines and Specifications for Flood Hazard Mapping Partners*, shall be provided on CD-ROM;
- Revised DFIRM database files, prepared in accordance with the requirements in *Guidelines and Specifications for Flood Hazard Mapping Partners*, shall be provided on CD-ROM;
- Revised metadata files describing the DFIRM data, including all required information shown in *Guidelines and Specifications for Flood Hazard Mapping Partners*, shall be provided on CD-ROM;
- A Summary Report that describes and provides the results of all automated or manual QA/QC review steps taken during the preparation of the DFIRM shall be provided.

### **Activity 14 - Post-Preliminary Processing**

Responsible Partners: City of Sturgis and FEMA (MCC)

Scope: Activity 14 consists of finalizing the DFIRM and FIS report after the Preliminary copies of the DFIRM and FIS report have been issued for public review and comment. The activities to be performed are summarized below.

*Initiation of Statutory 90-Day Appeal Period:* When required, upon completion of a 30-day community comment period and/or final coordination meeting with the community, the MCC shall arrange for and verify that the following activities are completed in accordance with the current version of the FEMA *Guidelines and Specifications for Flood Hazard Mapping Partners* and *Document Control Procedures Manual*:

- Proposed BFE determination letters are sent to the community CEOs and floodplain administrators.
- News release notifications of BFE changes are published in a prominent newspaper with local circulation.
- The appropriate notice (Proposed Rule) is published in the *Federal Register*.

*Resolution of Appeals and Protests:* The City and the MCC shall support FEMA in reviewing and resolving appeals and protests received during the 90-day appeal period. For each appeal and protest, the following activities shall be conducted as appropriate:

- Initial processing and acknowledgment of submittal;
- Technical review of submittal;
- Preparation of letter(s) requesting additional supporting data;
- Performance of revised analyses; and
- Preparation of a draft resolution letter and revised DFIRM and FIS report materials for FEMA review.

The MCC shall mail all associated correspondence upon authorization by FEMA.

*Preparation of Special Correspondence:* The City and the MCC shall support FEMA in responding to comments not received within the 90-day appeal period (referred to as “special correspondence”), including drafting responses for FEMA review when appropriate and finalizing responses when requested by FEMA. The MCC also shall mail the final correspondence (and enclosures if appropriate) and distribute appropriate copies of the correspondence and enclosures upon receipt of authorization from FEMA.

*Revision of FIRM and FIS Report:* If necessary, the MCC shall work together with the City to revise the DFIRM and FIS report at the direction of the FEMA Regional Project Officer and distribute Revised Preliminary copies of the DFIRM and FIS report.

*Final SOMA Preparation:* The MCC shall prepare Final SOMAs for the City and County if appropriate.

*Processing of Letters of Final Determination:* The MCC shall work with FEMA to establish the effective date for the DFIRM and FIS report, and shall prepare a Letter of Final Determination (LFDs) for each community for FEMA review in accordance with the FEMA *Document Control Procedures Manual*. The MCC also shall mail the final signed LFDs and enclosures and distribute appropriate copies of the signed LFDs and enclosures upon receipt of authorization from FEMA.

*Processing of Final DFIRM and FIS Report for Printing:* The MCC shall prepare final reproduction materials for the DFIRM and FIS report and provide these materials to the FEMA Map Service Center for printing by the U.S. Government Printing Office. The MCC also shall prepare the appropriate paperwork to accompany the DFIRM and FIS report (including Print Processing Worksheet, Printing Requisition Forms, and Community Map Actions Form) and transmittal letters to the community CEOs.

*Revalidation Letter Processing.* If appropriate, the MCC shall prepare and distribute letters to the community CEOs and floodplain administrators to notify the communities about Letters of Map Change for which determinations will remain in effect after the DFIRM and FIS report become effective.

*Archiving Data:* The MCC shall ensure that technical and administrative support data are packaged in the FEMA required format and stored properly in the library archives until they are transmitted to the FEMA Engineering Study Data Package Facility.

Standards: All work under Activity 14 shall be performed in accordance with the standards specified in Section 5 of this Mapping Activity Statement.

Products: In accordance with the requirements provided in the current version of the FEMA *Guidelines and Specifications for Flood Hazard Mapping Partners* and *Document Control Procedures Manual*, the CWCB, the SC, and/or the MCC shall make the following products available to FEMA:

- Documentation that the news releases were published in accordance with FEMA requirements;
- Documentation that the appropriate *Federal Register* notices (Proposed and Final Rules) were published in accordance with FEMA requirements;
- Draft and final Special Correspondence (and all associated enclosures, backup data, and other related information) for FEMA review and signature as appropriate;
- Draft and final Appeal and Protest acknowledgment, additional data, and resolution letters (and all associated enclosures, backup data, and other related information) for FEMA review and signature as appropriate;
- Draft and final LFDs (and all associated enclosures, backup data, and other related information) for FEMA review and signature;
- DFIRM negatives and final FIS report materials, including all updated data tables and Flood Profiles;
- Paperwork for the final DFIRM and FIS report materials;
- Transmittal letters for the printed DFIRM and FIS report;
- Letter of Map Change Revalidation Letters if appropriate; and
- Complete, organized archived technical and administrative support data.

## **2. Technical and Administrative Support Data Submittal:**

The Project Team members for this Flood Map Project that have responsibilities for activities included in this Mapping Activity Statement shall comply with the data submittal requirements summarized below.

All supporting documentation for the activities in this Mapping Activity Statement shall be submitted in the Technical Support Data Notebook (TSDN) format in accordance with Appendix M, Subsection M.2.1 of FEMA's *Guidelines and Specifications for Flood Hazard Mapping Partners*, dated February 2002. Appendix M is available for viewing or download on the FEMA

Web site at [http://www.fema.gov/pdf/fhm/frm\\_gsam.pdf](http://www.fema.gov/pdf/fhm/frm_gsam.pdf) Table 2-1 (see next page) indicates the sections of the TSDN that apply to each mapping activity.

**Table 2-1. Mapping Activities and Applicable TSDN Sections**

TSDN Section	Mapping Activities													
	1	2	3	4	5	6	7	8	9	10	11	12, 12A	13	14
<b>General Documentation</b>														
Special Problem Reports	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Telephone Conversation Reports	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Meeting Minutes/Reports	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
General Correspondence	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
<b>Engineering Analyses</b>														
Hydrologic Analyses	✓			✓	✓	✓	✓	✓	✓					
Hydraulic Analyses	✓			✓	✓	✓	✓	✓	✓					
Key to Cross-Section Labeling	✓			✓	✓	✓	✓	✓	✓					
Key to Transect Labeling	✓			✓	✓	✓	✓	✓	✓					
<b>Draft FIS Report</b>				✓	✓	✓	✓							
<b>Mapping Information</b>		✓						✓	✓	✓	✓	✓	✓	✓
<b>Miscellaneous Reference Information</b>	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

If any issues arise that could affect the completion of an activity within the proposed scope or budget, the responsible Mapping Partner shall complete a Special Problem Report (SPR) as soon as possible after the issue is identified and submitted to FEMA. The SPR should describe the issue and propose possible resolutions. (For additional information on SPRs, refer to Appendix M, Subsection M.2.1.1 of *Guidelines and Specifications for Flood Hazard Mapping Partners*.)

Additionally, the MCC shall collect and maintain a set of products for all Activities and shall compile a comprehensive TSDN for the entire project.

### **3. Period of Performance:**

The mapping activities outlined in this Mapping Activity Statement will begin on September 15, 2002, and will be completed no later than September 30, 2004. The mapping activities may be terminated at the option of FEMA or the City of Sturgis in accordance with the provisions of the Partnership Agreement dated July 16, 2002.

### **4. Funding/Cost-Sharing:**

### **5. Standards:**

The standards relevant to this Mapping Activity Statement are provided in Tables 5-1 and 5-2. Information on the correct volume, appendix, section, or subsection of FEMA's *Guidelines and Specifications for Flood Hazard Mapping Partners* (February 2002) to be referenced for each mapping activity are summarized in Table 5-2. These Guidelines are available for viewing or download from the FEMA Flood Hazard Mapping Web site at [http://www.fema.gov/fhm/dl\\_cgs.shtm](http://www.fema.gov/fhm/dl_cgs.shtm) .

**Table 5-1. Applicable Standards for Mapping Activities**

Applicable Standards	Activities													
	1	2	3	4	5	6	7	8	9	10	11	12, 12A	13	14
<i>Guidelines and Specifications for Flood Hazard Mapping Partners, February 2002</i>	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
American Congress on Surveying and Mapping (ACSM) procedures	✓	✓	✓											
Global Positioning System (GPS) Surveys: National Geodetic Survey (NGS-58), "Guidelines for Establishing GPS-Derived Ellipsoid Heights," November 1997	✓	✓	✓											
EM 1000-1-1000, <i>Photogrammetric Mapping</i> , March 31, 1993	✓	✓	✓											
EM 1110-2-1003, <i>Hydrographic Surveys</i> , October 31, 1994	✓		✓											
Numerical Models Accepted by FEMA for NFIP Usage, January 11, 2002				✓	✓	✓	✓							
<i>Content Standards for Digital Geospatial Metadata</i> (Federal Geographic Data Committee, 1998)		✓	✓					✓	✓	✓	✓	✓	✓	✓
<i>Document Control Procedures Manual</i> , December 2000													✓	✓

**Table 5-2. Mapping Activities and Applicable Portions of FEMA Guidelines and Specifications**

Activity Number	Activity Description	Applicable Volume, Section/Subsection, and Appendix
1	Field Surveys and Reconnaissance	Volume 1, Sections 1.2, 1.3, 1.4 (specifically Subsection 1.4.2.1) Appendix A, Sections A.5, A.6, A.7, and A.8 Appendices B, C, and M
2	Topographic Data Development	Volume 1, Section 1.4 (specifically Subsection 1.4.2.1) Appendix A, Sections A.2 and A.3 Appendix M
3	Independent QA/QC Review of Topographic Data	Volume 1, Section 1.4 (specifically Subsections 1.4.1 and 1.4.2.1) Appendix A, Sections A.2, A.3, A.7 (specifically Subsection A.7.5), and A.8 (specifically Subsection A.8.6) Appendix M
4	Hydrology	Volume 1, Section 1.4 (specifically Subsections 1.4.2.2 and 1.4.2.4) Appendix C, Sections C.1 and C.7 Appendices E, F, G, H, and M
5	Independent QA/QC Review of Hydrology	Volume 1, Section 1.4 (specifically Subsection 1.4.1) Appendix C, Section C.2 Appendices E, F, G, H, and M
6	Hydraulic Analyses	Volume 1, Section 1.4 (specifically Subsections 1.4.2.2 and 1.4.2.4) Appendix A, Section A.4 (specifically Subsection A.4.7) Appendix C, Sections C.3 and C.7 Appendices B, E, F, G, H, and M

**Table 5-2. Mapping Activities and Applicable Portions of FEMA *Guidelines and Specifications* (Cont'd)**

Activity Number	Activity Description	Applicable Volume, Section/Subsection, and Appendix
7	Independent QA/QC Review of Hydraulic Analyses	Volume 1, Section 1.4 (specifically Subsection 1.4.1) ----- Appendix A, Section A.4 (specifically Subsection A.4.7) ----- Appendix C, Section C.5 ----- Appendices B, E, F, G, H, and M
8	Floodplain Mapping (Detailed Riverine Analysis)	Volume 1, Section 1.4 (specifically Subsection 1.4.2.3) ----- Appendix C, Sections C. 4 and C.6 ----- Appendices K, L, and M
9	Independent QA/QC Review of Floodplain Mapping	Volume 1, Section 1.4 (specifically Subsections 1.4.1 and 1.4.2.3) ----- Appendix C, Sections C.4 and C.6 ----- Appendices D, K, L, and M
10	Base Map Acquisition and Preparation	Volume 1, Sections 1.3 (specifically Subsection 1.3.1.8) and 1.4 (specifically Subsection 1.4.3) ----- Appendices A and B

**Table 5-2. Mapping Activities and Applicable Portions of FEMA *Guidelines and Specifications* (Cont'd)**

Activity Number	Activity Description	Applicable Volume, Section/Subsection, and Appendix
11	DFIRM Production (Non-Revised Areas)	Volume 1, Section 1.4 (specifically Subsections 1.4.2.3 and 1.4.3.2) ----- Appendices K, L, and M
12	Merging of Revised and Non-Revised Information	Volume 1, Section 1.4 (specifically Subsections 1.4.2.3 and 1.4.3.3) ----- Appendices K and L
12A	Application of DFIRM Graphic and Database Specifications	Volume 1, Section 1.4 (specifically Subsection 1.4.3) ----- Appendices K and L
13	Preparation and Issuance of Preliminary FIS and DFIRM	Volume 1, Sections 1.4 (specifically Subsections 1.4.2 and 1.4.3) and 1.5 (specifically Subsection 1.5.1) ----- Appendices J, K, L, and M
14	Post-Preliminary Processing	Volume 1, Section 1.5 ----- Appendices J, K, L, and M

**6. Schedule:**

The mapping activities for this Mapping Activity Statement shall be completed in accordance with the schedule below. If changes to this schedule are required, the responsible Mapping Partner shall coordinate with FEMA and the other Mapping Partners in a timely manner.

ACTIVITY	RESPONSIBLE PARTNER	DATE DUE
Activity 1 – Field Surveys and Reconnaissance	CTP	11-15-02
Activity 2 – Topographic Data Development	CTP	11-15-02
Activity 3 – Independent QA/QC Review of Topographic Data	CTP	12-15-02
Activity 4 – Hydrologic Analyses	CTP	03-15-03
Activity 5 – Independent QA/QC Review of Hydrologic Analyses	FEMA (MCC)	04-15-03
Activity 6 – Hydraulic Analyses	CTP	06-15-03
Activity 7 – Independent QA/QC Review of Hydraulic Analyses	FEMA (MCC)	07-15-03
Activity 8 – Floodplain Mapping (Detailed Riverine Analysis)	CTP	08-15-03
Activity 9 – Independent QA/QC Review of Floodplain Mapping	FEMA (MCC)	09-15-03
Activity 10 – Base Map Acquisition and Preparation	CTP	06-15-03
Activity 11 – DFIRM Production (Non-Revised Areas)	FEMA (MCC)	10-15-03
Activity 12 – DFIRM Production (Merging Effective and Revised Information)	FEMA (MCC)	11-15-03
Activity 12A – Application of DFIRM Graphic and Database Specifications	FEMA (MCC)	11-15-03
Activity 13 – Preliminary DFIRM and FIS Report Distribution	FEMA (MCC)	12-15-03
Activity 14 – Post-Preliminary Processing	CTP, FEMA (MCC)	11-15-04

**7. Certification:**

The following certifications apply to this Mapping Activity Statement:

**Activity 1 (Field Surveys and Reconnaissance) and Activity 2 (Topographic Data Development)**

A Registered Professional Engineer or Licensed Land Surveyor will certify topographic data, in accordance with 44 CFR 65.5(c). Certification of topographic data by the American Society for Photogrammetry and Remote Sensing is also acceptable.

**Activity 4 (Hydrologic Analyses), Activity 6 (Hydraulic Analyses), and Activity 8 (Floodplain Mapping)**

- A Registered Professional Engineer or Licensed Land Surveyor will certify hydrologic and hydraulic analyses and data in accordance with 44 CFR 65.6(f).
- A Registered Professional Engineer or Licensed Land Surveyor will certify topographic information in accordance with 44 CFR 65.5(c).
- Any levee systems to be accredited will be certified in accordance with 44 CFR 65.10(e)..

**Activity 8 (Floodplain Mapping – Detailed Riverine Analysis) and Activity 13 (Application of DFIRM Database and Graphic Specifications)**

The DFIRM metadata files will include a description of the horizontal and vertical accuracy of the DFIRM base map and floodplain information.

**Activity 10 (Base Map Acquisition and Preparation)**

- A community official or responsible party will provide written certification that the digital data meet FEMA’s minimum standards and specifications.
- The responsible Mapping Partner will provide documentation that the digital base map can be used by FEMA.

**8. Technical Assistance and Resources:**

The City of Sturgis may obtain copies of FEMA-issued Letters of Map Change, archived technical and administrative support data, and data collected as part of the FEMA Mapping Needs Assessment Process from the MCC. The MCC may be contacted by telephone at (703) 317-6531 or by facsimile at (703) 329-3023.

General technical and programmatic information, such as FEMA 265, the Quick-2 computer program, and the MT-2 application/certification forms package, can be downloaded from the FEMA Flood Hazard Mapping Web site ([www.fema.gov./mit/tsd/](http://www.fema.gov./mit/tsd/)).

Specific technical and programmatic support may be provided through the MCC. Such assistance should be requested through the MCC Project Officer at FEMA Headquarters specified in Section 11 of this Mapping Activity Statement.

The City also may consult with the FEMA Regional Project Officer to request support in the areas of selection of data sources, digital data accuracy standards, assessment of vertical data accuracy, data collection methods or subcontractors, and GIS-based engineering and modeling training.

## **9. Contractors:**

The City of Sturgis intends to use the services of Ferber Engineering Company as a contractor for this Flood Map Project. The City shall ensure that the procurement for all contractors used for this Flood Map Project complies with the requirements of 44 CFR 13.36.

Part 13 may be downloaded in PDF or text format from the U.S. Government Printing Office Web site at [http://www.access.gpo.gov/nara/cfr/waisidx\\_01/44cfr13\\_01.html](http://www.access.gpo.gov/nara/cfr/waisidx_01/44cfr13_01.html).

## **10. Financial Reporting:**

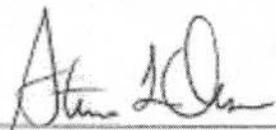
Financial reporting requirements will be in accordance with Cooperative Agreement Articles V and VI.

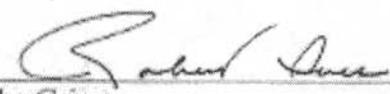
## **11. Points of Contact:**

The points of contact for this Flood Map Project are John Liou, P.E., C.F.M., the FEMA Regional Project Officer; Bob Kaufman, the Project Manager for the City of Sturgis; or subsequent personnel of comparable experience who are appointed to fulfill these responsibilities. The assistance of the MCC should be requested through Mike Grimm, the MCC Project Officer at FEMA Headquarters.

Each party has caused this Mapping Activity Statement to be executed by its duly authorized representative.

  
\_\_\_\_\_  
~~John K. Krumm~~ Mark Zeigler Date 9-10-02  
~~Project Manager~~ Mayor  
City of Sturgis

  
\_\_\_\_\_  
John Liou, P.E., C.F.M. Date 9/13/02  
Regional Project Officer  
Federal Emergency Management Agency

  
\_\_\_\_\_  
Mike Grimm Date 9/13/02  
MCC Project Officer  
Federal Insurance and Mitigation Administration